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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,608	12/20/2005	Takashi Ogura	NEC04P012-TOb	6489
21254 7590 04/20/2007 MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			EXAMINER PHAM, HOAI V	
			ART UNIT	PAPER NUMBER
			2814	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/20/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.		Applicant(s)	
	10/561,608		OGURA ET AL.	
	Examiner		Art Unit	
	Hoai v. Pham		2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 16-47 is/are pending in the application.
- 4a) Of the above claim(s) 3-8, 16-24 and 28-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 9-13 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/20/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I and Species III (Figure 5) in the reply filed on March 15, 2007 is acknowledged.
2. Claims 3-8, 16-24, and 28-47 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
5. **Claims 1-2, 9-13, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. [U.S. Pat. 6,913,980] in view of Kubota et al. [U.S. Pat. 7,094,639].**

With respect to claim 1, Wu et al. (fig. 23, cols. 5-11) disclose a semiconductor device comprising a MIS type field effect transistor, wherein the transistor comprising:

a silicon substrate (304);

a gate insulating film (312) comprising a high-dielectric-constant metal oxide film and a silicon containing insulating film (col. 6, lines 9-23 and col. 8, lines 25-27) formed on the silicon substrate;

a silicon containing gate electrode (310) formed on the gate insulating film; and

a sidewall (336) including silicon oxide as a constituting material, which is formed on each lateral face side of the gate electrode; and

wherein a silicon nitride film (330) is interposed between the sidewall and at least the lateral face of the gate electrode, and wherein the silicon nitride film covers the lateral face of the high-dielectric-constant metal oxide film, and a silicon oxide film (328) underlies the silicon nitride film.

Wu et al. disclose a silicon containing insulating film lying between the metal oxide film and the silicon substrate. However, Kubota et al. disclose that the silicon containing insulating film (13) lying between the metal oxide film (14) and the silicon substrate (11) (fig. 1 and col. 5, lines 47-49). Therefore, it would have been obvious to one having skill in the art to use the silicon containing insulating film lying between the metal oxide film and the silicon substrate as taught by Kubota et al. into the device of Wu et al. in order to prevent a reaction between the silicon substrate and the high dielectric constant.

With respect to claim 2, Wu et al. (fig. 23) disclose that the silicon nitride film (330) is laid between the sidewall and the silicon substrate.

With respect to claim 9, Kubota et al. (fig. 1 and col. 6, lines 36-39) disclose that a silicon nitride film (13) is laid between the high-dielectric-constant metal oxide film and the gate electrode.

With respect to claims 10-11, Wu et al. (fig. 23 and col. 6, lines 17-18) disclose that the high-dielectric-constant metal oxide film contains hafnium (Hf) and a dielectric constant of the high-dielectric-constant metal oxide film (Hf) is not less than 10.

With respect to claim 12, Wu et al. (fig. 23 and col. 6, lines 36-39) disclose that the high-dielectric-constant metal oxide film is absent beneath the sidewall.

With respect to claim 13, Kubota et al. (col. 1, lines 18-20) disclose that a gate length of the gate electrode is not greater than 1 μm .


With respect to claim 25, Wu et al. (fig. 23 and col. 9, lines 31-32) disclose that a thickness of the silicon oxide film is within a range of 1 to 20 nm.

With respect to claims 26-27, Wu et al. does not teach the exact thickness range of the silicon oxide film and the silicon nitride film, as claimed by Applicant. However, the thickness range would have been obvious to an ordinary artisan practicing the

invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, it appears that these changes produce no functional differences and therefore would have been obvious. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.
7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


HOAI PHAM
PRIMARY EXAMINER